Decision

And

Findings of Compliance

March 13, 2017

Usibelli Coal Mine, Incorporated

Jumbo Dome Mine Road Corridor

Major Revision: Incidental Boundary Revision

R-S0605-12092015

Surface Mining Permit Application

S-0605

TABLE OF CONTENTS

INTRODUCTION

This document is the Decision to approve the application for a major revision to the Jumbo Dome Road Corridor surface coal mine permit (Permit No. S-0605) submitted by Usibelli Coal Mine, Inc., P.O. Box 1000, Healy, Alaska 99743. This document was prepared by the Alaska Department of Natural Resources (ADNR), Division of Mining, Land and Water, Mining Section (DMLW-Mining). A summary of the history of the review of the application, a description of the environment affected by the operation, a brief description of the mining and reclamation plan, and the written Findings of Compliance are included to help document the decision process.

Detailed information regarding the processing of permits and permit requirements can be found in the Alaska Surface Coal Mining Control and Reclamation Act (AS 27.21) and the Alaska Surface Coal Mining Regulations (11 AAC 90). References to these requirements appear throughout this document. Detailed information regarding the proposed mining and reclamation operation can be found in the permit application which is available for public review and copying at the Anchorage office of the Division of Mining, Land and Water (550 W 7th Ave Suite 920, Anchorage Alaska 99501), and at the Fairbanks office of the Division of Mining, Land and Water (3700 Airport Way, Fairbanks, Alaska 99709). Inquiries should be directed to Russell Kirkham of the Division of Mining, Land and Water at the above address, by phone at 907-269-8650, or by e-mail at russell.kirkham@alaska.gov

1.0 HISTORY OF REVIEW

Usibelli Coal Mine (UCM), Incorporated, submitted an application for a major revision to the Jumbo Dome Mine Road Corridor (JDRC) Permit (Permit No. S-0605) on December 8, 2015. DMLW-Mining initiated the completeness review process for the permit. DMLW-Mining distributed either the application or portions of it to agencies for comments on the application's completeness.

The application was determined to be administratively complete on August 15, 2016. Public notice of the complete application was given for the period starting on August 24, 2016 and ending on October 14, 2016. Legal ads were placed in Fairbanks Daily News Miner on August 24, 2016and were posted once a week for four consecutive weeks. In addition, the Public Notice was posted on the DNR Public Notice website and in the Healy, Alaska Post Office. On August 24, 2016, the notice was mailed directly to DMLW-Mining's mailing list of affected persons and agencies. The complete application was made available at DMLW's offices in Anchorage and Fairbanks and posted on DMLW-Mining's website at www.dnr.state.ak.us/mlw/mining/ index.htm.

Two agency comments requiring stipulations were received. No public comments were received. The Response to Comments concerning this major revision is located in: "Appendix A: Response to Agency Comments''. No request for an informal conference was received from any of the people who commented on the major revision. Technical review of the project ended on January 15, 2017. Decision to approve the major revision application was finalized on February

15, 2017.

2.0 ENVIRONMENT AFFECTED

2.1 Introduction

UCM's original request was to increase the JDRC permit boundary by a total of 448 acres. 78 acres was requested along the east boundary between Cut 9 and the 1st Wetland Crossing to allow for a larger buffer between the disturbance area and the permit boundary which in turn will provide for easier inspection and compliance/maintenance activities on the east side On the west side of JDRC boundary, UCM requested 370 acres to develop a 42-acre gravel site and an associated 80-wide haul road to access this gravel. This proposed increase would span from Cut 10 to just north of the First Wetland Crossing and west to the extent of the coal lease ADL 673538.

After review and further discussions with UCM, DMLW-Mining will authorize the request with the following modifications: 190 acres along the western boundary for the development of the 42-acre gravel source and buffer and the approximately mile long, 80-foot wide access road and associated buffer and 110 acres along the eastern boundary to allow for more efficient monitoring and compliance between the permit and disturbance boundaries (figure 1).[1]

The remainder of this section summarizes the background information presented in the original permit application, and is taken from the original Final Decision and Findings of Compliance for the Jumbo Dome Mine Road Corridor permit.

2.2 Location

The Jumbo Dome Mine Road Corridor area is in the northern foothills of the Alaska Range amid rugged terrain. The permit area is north of Hoseanna Creek (also known as Ligntite Creek) on the eastern side of the Nenana River. The area is north of the present Poker Flats Mine and is located approximately 100 miles south of Fairbanks, Alaska, and eight (8)miles northeast of Healy, Alaska. The mine is located within: Sections 4, 8, 9, 19, 20, 29, and 30, Township 11 South, Range 6 West; and Sections 25, 36, Township 12 South, Range 7 West, Fairbanks Meridian.

The area can be found on the Healy D-4 quad map.

1 Please see JDRC Attachment A, Plate D1-1 for more detail.

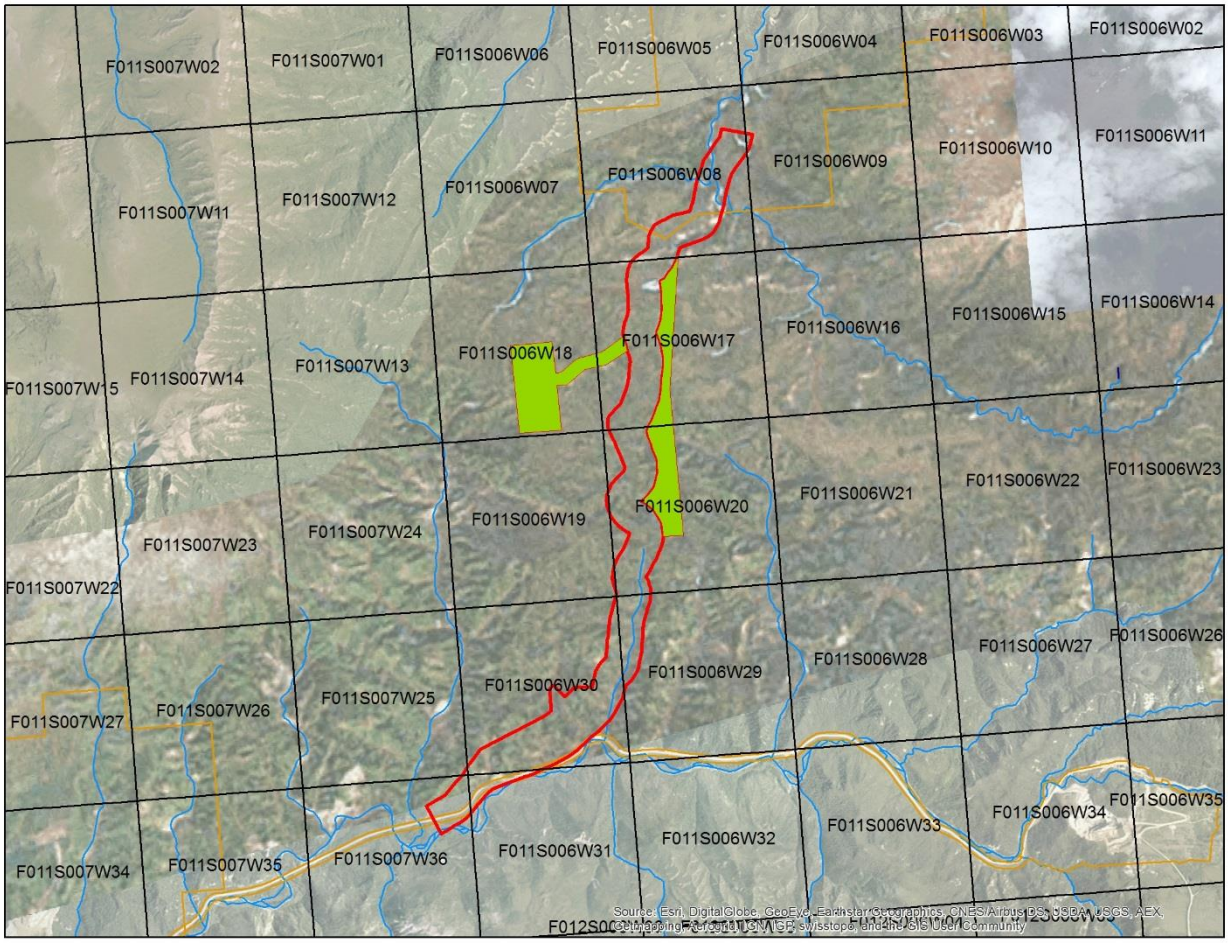

Figure 1 Location of the JDRC permit. The green shaded regions are the new areas approved as part of this revision and IBR.

2.3 Climate

The climatic conditions of the area are discussed in Part "IC", Chapter I of the application. The information and data in this part was generated primarily from three weather stations in the vicinity. The elevation of the permit area ranges between 1,200 feet and 2,600 feet above mean sea level. The area is typical of subarctic regions having short warm summers and long cold winters. Average summer temperatures vary from approximately 44 ^{0} to 69 ^{0} F while winter temperatures are in the - 6 ^{0} to 16 ^{0} F range. Wind was stated to be predominantly from the southeast, secondarily from the northwest, and often gusting to over 40 mph during the winter months. The winds travel up and down the Nenana River valley the majority of the time. Records indicate that the average yearly rainfall equivalent is approximately 14.0 to 16.5 inches with the majority of this falling as rain in the months of June, July, and August.

The Alaska Department of Environmental Conservation determined that no air quality permit was required for the mine.

2.4 Cultural

Cultural and Historical information is discussed in *Part 'C', Chapter I* of the application. A portion of the Jumbo Dome Mine Road Corridor area had been previously surveyed for archeological sites. It was concluded at that time that the area did not contain significant cultural properties and the surrounding areas had poor potential for site preservation. Suitable areas for the preservation of archeological sites was recently surveyed in July and August of 2005. No new cultural resources were discovered.

The State Historic Preservation Officer (ADNR, Division of Parks and Outdoor Recreation) has determined that known cultural and historic sites have been adequately identified or investigated for the Jumbo Dome Mine Road Corridor and the site was cleared on January 27, 1997.

2.5 Soils

Information pertaining to the soils of the Jumbo Dome Mine Road Corridor is discussed in *Part 'C', Chapter X* of the application. General pre-mining soil resource information for the area was derived from a 1992 report prepared for Usibelli Coal Mine by the University of Alaska Fairbanks Agricultural and Forestry Experiment Station, Palmer, Alaska. Dr. Chien-Lu Ping, Associate Professor of Soil Science, prepared the report and performed the field investigation upon which the report was based. During the summer of 2005 a survey specific to the Jumbo Dome Mine corridor was prepared by Dr. Chien-Lu Ping. Soil mapping and classification was performed using a combination of ground reconnaissance, air photo interpretation, and sampling of representative soil types in test pits and by hand borings. The purpose of the study was to characterize and classify the soils within the lease areas with respect to their chemical and physical properties, depth and extent, and in order to provide a baseline data set that will have utility for mine permitting for the corridor route. A total of 45 soil pits (pedons) were excavated throughout the lease areas during the Order 3 inventory.

2.6 Surface Water

Surface water hydrology is discussed in Part 'C", Chapter IV of the application. Surface waters within the future disturbance area include the first unnamed drainage east of Popovitch Creek (approximately 1.4 miles in length and with a drainage area of approximately 250 acres) along Hoseanna Creek, tributaries of Marguerite Creek, and a crossing of Marguerite Creek. Each of these tributary drainages has an individual surface area representing less than 4 percent of the main drainages. Surface water bodies in the mining area include not only creeks, but springs, seeps, and ponds.

Hoseanna Creek, the primary watershed in the area south of the permit, drains an area of approximately 49 square miles and has significant tributaries located upstream of the permit area. Hoseanna Creek flows year-around and exhibits peak flows due to snowmelt between late May

and early June. Peak flows from fall rains occur during mid-August to mid-September. It has high levels of suspended solids and is slightly acidic to basic in character.

Marguerite Creek, the primary watershed in the area north of the permit, drains an area of approximately 16 square miles. Marguerite creek flows year round and like Hoseanna Creek has its peak discharge in the months of May and June during breakup. Marguerite Creek has low sediment concentration.

From 1986 through 2006 the ADNR, Alaska Hydrologic Survey (AHS) measured discharge and collected surface and groundwater samples in the Hoseanna Creek basin. Marguerite Creek has a continuous recording station that measures peak stream flow, daily discharge. Also the USGS routinely samples this site for sediment and temperature data.

UCM is the only surface water user in the general area.

2.7 Groundwater

Information pertaining to the hydrogeology of the Jumbo Dome Mine Road Corridor Mine is discussed in *Part 'C', Chapter IV* of the application. In general precipitation infiltrates near the southerly coal outcrop areas and works its way west and north in an unconfined state. As the coal seams continue to dip to the north, they become fully saturated and begin to saturate the overlying sandstone. Water-level data indicates water bearing units within the Suntrana Formation in the mining area include the number 2, 3, 4, 5, and 6 coal seams as well as slide materials, and the Two Bull, Frances, and Louise Creek alluvium. Throughout the Hoseanna Creek basin, the primary aquifers tend to be the coal seams, with the underlying clays acting as aquacludes and the overlying sandstones as aquatards. Permeability is controlled by fractures within the coal. Faults also generally act as recharge boundaries supplying the coal seams, however, where faults intersect coal seams and then outcrop down gradient, they may act as a discharge area for the seams.

Groundwater at the site can be characterized as mildly acidic with pH values ranging from 5.83 to 6.77. Temperatures range from 3.4^0 to 15^0 C. Total dissolved solids (TDS) concentrations indicate that groundwater at the site varies from fresh to brackish. Individual coal seams have TDS concentrations ranging from 101 to 260 mg/L. Calcium and bicarbonate are the dominate cation and anion present in the groundwater from the coal seams. Alluvial well sampling indicates a sodium-chloride type groundwater. No nutrients were detected in the groundwater, with the exception of ammonia and nitrate in well 96TM2C. In general, most dissolved trace metals, nonmetals, and metalloids included in the baseline sampling suite were either not detected or were near the detection limits.

The applicant is the only groundwater user in the general area.

2.8 Vegetation

Information pertaining to the vegetation of the Jumbo Dome Mine Road Corridor area is discussed in a stand-alone document titled "Preliminary Wetland Determination and Vegetation Survey", and in Part "C'; Chapter VIII of the application. Pre-mining vegetation resource information for the area is derived from a report prepared for Usibelli Coal Mine by Travis Peterson Environmental Consulting, Inc. The report is based on desktop studies of available data and field work conducted during the summer of 2005. Vegetation mapping and classification was performed using a combination of ground reconnaissance, air photo interpretation, and sampling of existing vegetative types and communities.

Desktop vegetation studies were based on data collected during the summers of 1989, 1990, and 1991. Field work for the vegetation study was performed during the summer of2005 along the road corridor. Sites within the permit area were inventoried to identify plant species, cover, and stem densities, as well as age, diameter at breast height, and height of trees. Diversity was calculated using relative species cover with Simpson's reciprocal index. All vegetation communities were identified to at least the overstory species (Level IV of the Alaska Vegetation Classification) and in most cases were identified to understory species (Level V). Over 140 vascular plant species were identified along with 14 mosses and 18 lichens on the study area which covered some 26 sections.

A total of 16 vegetation communities were delineated on the area studied for the permit. They included open white spruce-balsam poplar, open white spruce-paper birch, open paper birch, closed white spruce-paper birch, closed alder, closed paper birch, open black spruce, open white spruce-paper birch/open ericaceous shrub, woodland white spruce, open white spruce, open birch-ericaceous shrub, woodland dwarf black spruce, woodland dwarf white spruce, open white spruce/open ericaceous shrub, immature poplar, and open white spruce/alder. The total vascular vegetation cover ranges from around 92% to 99% while the Simpson's reciprocal diversity ranged from 2.5 to 5.6 on the new areas.

No threatened or endangered plant species were found on or near the permit area.

2.9 Fish and Wildlife

Fish and Wildlife information pertaining to the Jumbo Dome Mine Road Corridor area is discussed in Part "C", Chapter IX of the application. Limited studies have taken place in the general area. Two studies directly relate to the Jumbo Dome Mine corridor, they are entitled "Biological Studies of a Proposed Power Plant Site Near Healy, Alaska" Woodward-Clyde Consultants (1979) and "Wildlife Food Habits and Habitat Use on Revegetated Stripmine Land in Alaska." Elliott, C. (1984). The area was inventoried for fish and wildlife resources as early as 1978. These surveys included aquatic sampling of Hoseanna Creek and California Creek (drainage directly below Marguerite Creek). Study results indicated that there are low numbers of small mammals, furbearers, and large mammals and low to moderate numbers of songbirds,

waterfowl, and raptors within the area. Disturbance of fish bearing waters is limited to the crossing of Marguerite Creek.

No threatened or endangered animal species were identified by the US Fish and Wildlife Service as being present in or near the permit area.

2.10 Land Use

Land use information is discussed in Part "C", Chapter XI of the application. Land within the Jumbo Dome Mine Road Corridor permit and adjacent areas consist of surface and subsurface, including the mineral estate, which is owned by the State of Alaska, the Mental Health Trust Land Unit, or Usibelli Coal Mine. The land is undeveloped and primarily used as wildlife habitat. The permit area is within the Denali Borough and is covered in subunit 4D of the Parks Highway/West Alaska Range subregion of the Tanana Basin Area Plan.

3.0 MINING AND RECLAMATION PLAN

3.1 Summary

The major change proposed by this revision would add acreage which includes a source of gravel to be used in the development and construction of the haul road and other infrastructure to support the Jumbo Dome Mine. The revision would also increase acreage to allow for a more practicable buffer between the disturbance area and the permit boundary.

The Jumbo Dome Mine Road Corridor is also expected to support future mining operations in the Marguerite Creek Valley. The JDRC permit area includes 906 acres of which approximately 270 acres will be disturbed and reclaimed over the mine's life. During the first 5-year permit term, the full 270 acres are scheduled to be disturbed. The primary purpose of the permit application is to develop access to the Jumbo Dome Mine.

3.2 Mining Techniques

The operation and reclamation plan is detailed in *Part* ‘D’ of the application. Blasting will be used for both loosening and casting overburden, and for fracturing the coal. Blasting will occur at any time between 6:00 AM and 9:00 PM or during daylight hours, whichever is greater. Construction activities for the Jumbo Dome Mine Road Corridor will involve cut, fill and grading work. Reclamation of the associated side slope areas will be an integral part of and will occur contemporaneously with the construction activities. The Jumbo Dome Road Corridor Project will generally start from the southern end, near the existing haul road and work north. The spoil from the initial cuts will be used to widen the Hoseanna Creek haul road back to Bridge 3 (in the Gold Run Pass mine permit area).. Final road alignment will be designed to minimize impact to wetlands. All crossings of fish bearing streams will need to be designed to allow efficient fish passage.

3.3 Approximate Original Contour and Excess Spoil

As construction progresses, side slopes will be vegetated to prevent erosion. After the life of the project is over, the road will be scarified and seeded. A small portion of the road will be left to allow public access for recreation activities after the end of mine life, in accordance with the DNR land use classification. Construction activities for the Jumbo Dome Road Corridor will involve cut, fill and grading work. Reclamation of the associated side slope areas will be an integral part of and will occur contemporaneously with the construction activities.

3.3 Top Soil Salvage and Replacement

The reclamation plan detailed in Part "D", Chapter III of the application calls for the removal of all topsoil and supplemental material meeting the removal criteria, in advance of disturbance. The criteria specify that soils will be salvaged unless they have pH of less than 4.0, have unsuitable texture or proportion of rock fragments, or are on slopes greater than 33%. Small vegetation may be stripped along with the topsoil or hydra-axed. Large vegetation not taken for firewood will be either hydra-axed, chipped for inclusion with the soil material, disposed of with the overburden, or placed in slash piles as part of the final wildlife habitat reclamation plan. As a general rule, topsoil will be either temporarily stockpiled or directly hauled and replaced on final regraded areas within 200' of the active regrade area which is within 800' of the first active spoil ridge. Bulldozers will be used to spread the topsoil to a minimum depth of 12", and all salvaged soils are to be replaced.

3.4 Post-Mining Land Use

The applicant intends to reclaim the area, primarily to a post-mining land use of wildlife habitat with a secondary land use of public recreation. These are consistent with the designated uses in the Tanana Basin Area Plan.

3.5 Post-Mining Drainage

No significant changes are expected to the pre mining drainage area. All culverts to be placed in the initial permit term associated with the permanent road are designed for the 100-year 24-hour storm event. All other drainages affected by road construction will be reclaimed to prevent impounding above filled areas.

3.6 Revegetation

Revegetation objectives are twofold. First, to quickly establish a ground cover that will control erosion. Second, to allow the natural revegetation of species that will become wildlife habitat in

the disturbed areas. The company will seed and fertilize disturbed areas with a seed mixture totaling 55 pound per acre of a mixture of native and adapted introduced plant species. The company will also plant naturally occurring woody plant species in varied shapes and locations to accelerate the natural regeneration process. However, the company does not guarantee that a particular species or community will be dominant on any individual acre of ground.

The bond release standards are the method in which the public is assured that the natural regeneration is occurring appropriately, and will re-establish a naturally occurring community within a reasonable period of time. The standards provide a method of quantifying the objectives outlined above.

The bond release standard for the first objective, erosion control, requires 65 percent cover of living and dead vegetation. The company will use a seed mix dominated by native and adapted grasses to provide the initial cover. The standard is a compromise of sorts: the higher the standard, the better erosion is controlled, but a denser grass cover will slow natural invasion by woody plant species which are important for wildlife habitat. DMLW-Mining believes that 65 percent will control erosion but allow natural invasion to occur.

The bond release standards for the second objective, natural regeneration appropriate for wildlife habitat, includes a woody vegetation density standard and a woody vegetation diversity standard. The woody vegetation density standard requires 450 stems per acre on two-thirds of the area. The 450 stems per acre are adapted from the DNR Division of Forestry reforestation standards for Region II (interior Boreal Forest). It is applied to only two-thirds of the area to allow open areas to remain that will provide additional diversity within the wildlife habitat. To ensure appropriate species' diversity, the standard for woody species requires that no more than 80 percent of the stem count be of any one woody species, and that three woody species be present in any bond release area and represent at least 5 percent of the total stem count.

3.9 Annual Report

An annual report detailing the previous year's mining and reclamation efforts is to be provided on July 31 throughout the permit term.

4.0 FINDINGS OF COMPLIANCE

4.1 Overview

Pursuant to 11 AAC 90.125 DMLW-Mining must make a number of written findings prior to the issuance of a Surface Mining Permit. These findings are based on the applicants' affirmative demonstration that information contained in the permit application, or otherwise available to DMLW-Mining and the public, demonstrates that the proposed mining operation will comply with the requirements of the Alaska Surface Coal Mining Program. Those written findings, which must be made under AS 27.21.180(c) and 11 AAC 90.125(a), and the specific approvals required under 11 AAC 90.301-90.501, are addressed in the relevant sections of this document.

The following documents and figures were either revised or new additions created to address the deficiencies identified in the technical review.

Part C: Environmental Resource Information

Part C Section 2 Geology
Part C Section 3 Overburden
Part C Section X Soil Resources
Plate CX-1

Part D: Operation and Reclamation Plan

Plate D1-1 (Version Date 12/16)
Part D Section 2 Life of Mine Plan
Part D Section 3 Topsoil Handling
Table D3.1
Plate D7-1
Part D Section 10
Plate D10-1
Part D Section 11
ABR_Jumbo Dome_Eagle_Final_Report_7_July_2016

4.2 Findings

The basis for the findings are discussed in the appropriate sections and included in this document.

AS 27.21.180(c)(1): The application is accurate and complete and it complies with the requirements of AS 27.21 and 11 AAC 90. This finding is based on extensive analysis of the application and the requirements of the regulatory program

AS 27.21.180(c)(2): The applicant has demonstrated that reclamation as required by AS 27.21 and 11 AAC 90 can be accomplished under the reclamation plan contained in the application. This finding is based on extensive analysis of the reclamation plan presented and the requirements of the regulatory program.

AS 27.21.180(c)(3): An assessment of the probable cumulative impact of all anticipated surface coal mining in the area on the hydrologic balance has been made and the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

AS 27.21.180(c)(4): The area proposed to be mined is not included within an area that is designated unsuitable for surface coal mining under AS 27.21.260 nor is it being considered for such a designation.

AS 27.21.180(c)(5): The proposed surface coal mining operation will not interrupt,

discontinue, or preclude farming on an alluvial valley floor nor will it materially damage the quantity or quality of water in surface or underground water systems which supply an alluvial valley floor.

AS 27.21.180(c)(6): Ownership of the coal in the permit area has not been severed from the private surface estate.

11 AAC 90.125(a)(2) and AS 27.21.180(f): Neither the applicant nor the operator has controlled mining operations with a demonstrated pattern of willful violations of AS 27.21 of such nature and duration and with such resulting irreparable damage to the environment as to indicate an intent not to comply with

AS 27.21.

11 AAC 90.125(a)(3): The applicant has assured that disturbances to the hydrologic balance will be minimized and that the water rights of present users will be protected.

11 AAC 90.125(a)(4): The applicant has obtained a negative determination of alluvial valley floors.

11 AAC 90.125(a)(5): The proposed post-mining land use of the permit area has been approved in accordance with 11 AAC 90.481.

11 AAC 90.125(a)(6): The operation will not affect the continued existence of known threatened or endangered species nor will it result in the destruction or adverse modification of their critical habitat as determined under the Endangered Species Act of 1973 (16 U.S.C. 1531, et. seq.)

11 AAC 90.125(a)(7): All specific approvals required when an existing structure is proposed to be used in the operation have been made.

11 AAC 90.125(a)(8): All specific approvals required under 11 AAC 90.301 through 11 AAC 90.501 have been made.

11 AAC 90.125(a)(9): The commissioner has determined the amount of bond necessary under 11 AAC 90.205.

11 AAC 90.125(a)(10): All specific approvals required when auger mining is proposed to be used in the operation have been made. (No augering is proposed.)

11 AAC 90.125(a)(11): The applicant has submitted proof that all reclamation fees required by 30 C.F.R. Part 870 have been paid.

4.3 General Compliance

Regulations at 11 AAC 90.125 require the Commissioner of the Department of Natural Resources to make certain findings before approving a permit for a surface coal mine. This section of the decision provides the discussions to explain and support those findings. Each of the required findings is also summarized at the end of this document.

4.3.1 Areas Unsuitable for Surface Coal Mining

The 906 acres in the permit area include no National Park System lands, National Wildlife Refuge System lands, National System of Trails lands, National Wilderness Preservation System lands, or Wild and Scenic Rivers System lands (including Study Rivers). No public parks or National Register of Historic Sites will be adversely affected. No mining will occur within 100 feet of the outside right-of-way line of any public road. No mining will occur within 300 feet of any occupied dwelling, public building, school, church, community or institutional building, or public park; or within 100 feet of a cemetery.

4.3.2 Applicant Compliance

Part 'B', Section 2.0 of the application states that the applicant has never had a Federal or State mining permit suspended or revoked. The applicant has not forfeited a mining bond or similar security deposited in lieu of a bond. The Office of Surface Mining's Applicant Violator System was checked on February 21, 2017 and indicated that there was one outstanding violation which is currently under appeal to the Commissioner of the Department of Natural Resources.

DMLW-Mining has reviewed Usibelli's compliance history and finds that it does not demonstrate a pattern of willful violation of AS 27.21 or 11 AAC 90 or indicate an intent not to comply with statutes or regulations in such a such manner as to result in irreparable damage to the environment.

4.3.3 Surface Owners Consent

Part 'B'; Section 3.0 of the application gives details on the surface and mineral ownership of the permit and adjacent area. The State of Alaska is the owner of the surface and mineral estate of part of the proposed permit and adjacent area. The application gives details on the coal leases. ADL 673536, ADL 60496, ADL 673537, ADL 673538, ADL 673539, ADL 21545, ADL 20633, and ADL 16925, that the applicant has acquired. As the lessee, the applicant has the legal right to enter and mine on all State land within the proposed permit area.

4.3.4 Post-Mining Land Use

Land use information is discussed in Part 'C'; Chapter XI of the application. Land within the Jumbo Dome Mine Road Corridor permit and adjacent areas consist of surface and subsurface, including the mineral estate, which is owned by either the State of Alaska, the Mental Health Trust Authority, or Usibelli Coal Mine. The land is undeveloped and primarily used as wildlife habitat. The permit area is within the Denali Borough and is within subunit 4D-1 of the Parks Highway/West Alaska Range subregion of the Tanana Basin Area Plan. The area plan designates the area for minerals and wildlife habitat as primary use, and

forestry and public recreation as secondary use. A post-mining land use of wildlife habitat with a secondary use of public recreation is consistent with the area plan.

Part D'; Section 10.2 of the permit application discusses the post-mining land use and reclamation plans for the Jumbo Dome Mine Road Corridor area. State lands will be reclaimed to wildlife habitat with a new permanent road left in place. DMLW-Mining has reviewed the proposed uses and designs. The Mental Health Trust Land Unit has reviewed and concur with the post-mining land uses and designs proposed in the permit application for their land which also includes wildlife habitat and a permanent road. All uses and facilities that are proposed to remain following reclamation have been accepted by the respective landowners.

4.3.4 Existing Structures

There are no existing structures on the permit area.

4.3.5 Special Categories of Mining

Mountain Top Removal. 11 AAC 90.141

The JDRC operations do not conform to the definition of mountain top removal, in which the mining activity removes entire seams through the upper portion of a mountain. Requirements for this category do not apply.

Steep Slope Mining 11 AAC 90.143

A "steep slope" is defined as any slope more than 20 degrees. Slopes in the JDRC area range from 1 to 34 degrees. However, the steeper slopes are found primarily in the east and northwest parts of the area and have already been mined. In the remainder of the mine area, gentler slopes will be mined. Requirements for this category do not apply.

Combined Surface and Underground Mining 11 AAC 90.147

The JDRC is exclusively a support facility for surface mining. Requirements for combined surface and underground mining do not apply.

Operations Near Alluvial Valley Floors 11 AAC 90.149

Local agricultural activities are precluded by permafrost and other adverse environmental conditions, and temperatures within the area prevent soils from being classed as prime farm lands.

Since the JDRC area is not considered "arid or semi arid," and does not have agricultural

potential, the area is not considered to be in or adjacent to an alluvial valley floor. Additional information concerning alluvial valley floors is not required.

In-Situ Processing 11 AAC 90.151

The JDRC does not include any of the activities identified as in-situ processing; hence requirements under this section do not apply.

Experimental Practices Mining 11 AAC 90.153

The JDRC has proposed no activities that would be considered experimental practices. The requirements under this section do not apply.

Facilities Outside Permit Area 11 AAC 90.155

The only support facility directly related to the JDRC which is, in part, located outside of the permit area is a UCM power line which connects the main Lignite Creek Mine area with the JDRC shop. Requirements for this power line are discussed under Part D of the application. Other UCM facilities (Gold Run Pass Mine, Poker Flats Mine, Two Bull Ridge Mine, Hoseanna Creek Haul Road, JDRC Road, Poker Flats East and West Tipple) are covered under separate permits.

Important Farmland 11 AAC 90.157

Land within the permit boundary bas been primarily used as wildlife habitat, and is to be returned to this use following mining. In addition, the SCS Exploratory Soil Survey of Alaska has determined the area to be unsuitable for cropland and rangeland for cattle and sheep. Hence, the area is not considered to be important farmland, therefore requirements under this section do not apply.

Auger Mining 11 AAC 90.125(a)(10)

No auger mining is proposed. The requirements for this finding do not apply.

4.3.6 Approvals Required Under 11 AAC 90.301 - 11 AAC 90.501

This section provides the Commissioner's determinations and findings necessary for certain practices under the performance standards of 11 AAC 90.301-11 AAC 90.501. It also describes important aspects of the application concerning those sections.

4.3.6.1 Signs and Markers

Part 'D'; Chapter 8 of the application discusses the design and placement of signs and markers. The Hoseanna Creek valley is being extensively mined. Access to the area is controlled by Usibelli Coal Mine, Inc. and the main entry roads have gated access. It would be difficult or impossible to access the area by road or foot without knowing that coal mining is occurring. Posting signs in addition to what is proposed and marking the entire permit boundary would serve no useful purpose. Therefore, under II AAC 90.30 I, the placement of signs and markers proposed in the application is

acceptable.

4.3.6.2 Soils

Various sections of the regulations address practices for the removal, storage, and replacement of topsoil. 11 AAC 90.311 allows approval of topsoil substitutes or supplements. The applicant proposes to use the existing topsoil and to supplement it with additional materials based on suitability criteria presented in *Part 'C', Chapter X* of the application. Overburden materials will only be allowed as a topsoil substitute in reclamation adjacent to the primary access road where the mapping units lack material that meets the salvage criteria. All topsoil on the disturbed area of the permit is to be salvaged and a minimum of 12 inches is to be replaced as described in *Part 'D', Section 10.0* of the application. This plan is acceptable.

4.3.6.3 Stream Buffer Zones

Under 11 AAC 90.353, approval of activities within 100 feet of a perennial or intermittent stream requires a finding that "any temporary or permanent stream channel diversion will comply with 11 AAC 90.327; mining activities will not adversely affect the water quantity and quality of the stream under applicable state and federal water quality laws and regulations; and that any adverse effect on fish, wildlife, or other environmental resources of the stream will be minimized."

Usibelli Coal Mine Inc (UCM) requested that the Alaska Department of Natural Resources approval for a SBZ waiver for the crossing of Marguerite Creek. As part of the submittal, UCM submitted a detailed design for a 15-foot culvert buried 6 feet into the stream bed. This design was approved by the Alaska Department of Fish and Game as maintaining fish passage in Marguerite Creek and designed to handle stream flow and winter icing in the creek.

UCM also requested permission to construct access trails below the haul road to install culverts and other water control structures associated with the Jumbo Dome Haul Road. These trails would be temporary trails and would be reclaimed when no longer needed for the construction of the haul road. Under 11 AAC 90.129(a), this minor revision to the permit is approved.

The construction of the proposed access trails are within 100 feet of the unnamed stream in eastern half of Section 30 T11S R6W of the Fairbanks Meridian. This stream meets the requirement of an intermittent stream protected under the Stream Buffer Zone (SBZ) Rule (11

AAC 90.353). As part of this revision, UCM requested that the Department grant a waiver from the SBZ rule for activity with 100 feet of the creek. Under the proposed revision, no activity is proposed within the active stream bed. The Department has reviewed the exemption request and finds that the sediment control measures prevent adverse impacts to the streams water quality and quantity proposed as part of the construction process which appropriately minimizes disturbance within 100 feet of this unnamed creek. Finally, the Department finds that proposed work will have minimal adverse affects on wildlife and environmental resources within the 100 foot SBZ.

DMLW finds that the proposed activities will not adversely affect the water quantity or quality of the streams under applicable state and federal water quality laws and regulations. Any adverse effect on fish, wildlife, or other environmental resources of the streams will be minimized. The DMLW-Mining approves a waiver to the Stream buffer zone under 11 AAC 90.353 for Margarite Creek to construct the haul road crossing and a waiver to construct access trails are within 100 feet of the unnamed stream in eastern half of Section 30 T11S R6W of the Fairbanks Meridian.

4.3.6.4 Excess Spoil

N/A

4.3.6.5 Timing Of Backfilling And Grading

N/A

4.3.6.6 Timing Of Backfilling And Grading

N/A

4.4 Fish and Wildlife

Fish and wildlife resources within the Hoseanna Creek basin were inventoried and assessed in separate studies in 1976 and 1984. The two studies were designed to evaluate the effects of development activities in the local area applicable to the proposed Jumbo Dome Mine project. The studies indicated that there are low numbers of small mammals, furbearers, large mammals, and low to moderate numbers of songbirds, waterfowl, and raptors.

Further studies of wetlands, vegetation and fish and wildlife habitat were conducted in the Jumbo Dome Mine permit area by WHPacific in 2007.

Habitat types in the project area include terrestrial uplands and wetlands as well as riverine habitats.

During the comment period the Alaska Department of Fish and Game (ADFG) and the U.S. Fish and Wildlife Service (USFWS) submitted comments and recommendations.

4.4.1 Wildlife Resources

Fish and Wildlife information pertaining to the Jumbo Dome Mine area is discussed in Part C, Chapter IX of the application. Bird and mammal species checklists are provided in Part C Table CIX-1 and Table CIX-2 of Chapter IX. The status of threatened and endangered fish and wildlife species is documented in Part C Chapter IX, Section 5.0.

Common wildlife species present in the area were determined using species lists for Denali National Park, the DNR Preliminary Best Interest Finding for the Healy Basin, the ADFG Wildlife Notebook Series and on-site observations.

Wildlife evidence was documented thorough direct observations, vegetation browse indicators, tracks, scats, trails and similar wildlife sign.

Issues and potential impacts

ADFG recommended that Section D-11, Fish and Wildlife Protection Plan, be updated and expanded to include a variety of wildlife management practices.

The US Fish and Wildlife Server (USFWS) recommended that. UCM update their raptor nest survey data and extend the survey distance two miles from any long-term disturbances or permanent impacts

If an unoccupied eagle nest will not be damaged, work could be conducted outside of the nesting season, which is March 1 through August 31 for all raptors, including eagles. Per USFWS recommendations UCM submitted an updated Eagle Nest Survey Report prepared by an independent contractor in July 2016. The survey found no bald or golden eagle nests within 0.5 miles of the proposed centerline of the Jumbo Dome Mine haul road. USFWS reiterated its recommendation that an eagle nest survey be conducted within 5 miles of the outer boundary of the mine footprint during the spring of 2012.

Based on the Jumbo Dome Miner Permit, the USFWS also recommended that Section D-11 include consideration to protect nesting migratory birds during land clearing for mine development and operations. The Migratory Bird Act prohibits the willful killing or harassment of migratory birds. The spring and summer breeding season is generally May 2 through July 15th. The USFWS recommends that initial clearing, excavation and fill activities for the project be completed before May 1. It was also recommended that to avoid excessive erosion areas greater than 5 acres not be cleared more than one month prior to initiating work.

Plants and animal species listed under the Endangered Species Act are not expected in the project area. Development of the Jumbo Dome Mine is not expected to impact any listed species or critical habitat in or outside of the project area. Surveys of the project area did not identify any bald or golden eagle nests. Typical nesting and foraging for bald eagles is limited or absent on site. Golden eagles have the potential to occur in the project area.

Compliance with ASCMCRA and Performance Standards

The Fish and Wildlife Protection Plan is in Part D, Section 11.0 of the application. ASCMCRA requires that each application include a plan to minimize or prevent disturbance and adverse impact to fish and wildlife resources.

Subsistence and personal use harvest of wildlife

Upland habitat in the area supports moose, bear, furbearers and songbirds. Moose are the most important species harvested for subsistence and sport hunting.

Wildlife Protection Plan

The goal of the Fish and Wildlife protection plan is to introduce and encourage habitat diversity through a variety of management techniques. These techniques include sediment control, topographic controls, and irregularity of vegetation and interspersion of micro habitats. The reclamation plan includes the planting of trees and shrubs to encourage greater use by a more diverse group of species.

There are no threatened, endangered or other sensitive species known to occur in the proposed mine area.

Findings

The with the above stipulation, application is in compliance with Sections 11 AAC 90.057, 11 AAC 90.081, 11 AAC 90.125(a)(6), 11 AAC 90.423, 11 AAC 90.457.

4.4.2 Fisheries Resources

Resource information

Fish and Wildlife information pertaining to the Jumbo Dome Mine area is discussed in Part C, Chapter IX of the application. The status of threatened and endangered fish and wildlife species is documented in Chapter IX, Section 5.0.

Issues and potential impacts

The ADFG determined that the largest potential effects of the Jumbo Dome Mine project would be on year-round fish habitat and passage within Marguerite Creek through the maintenance of adequate surface and subsurface flows.

Compliance with ASCMCRA and Performance Standards

The Fish and Wildlife Protection Plan is in Part D, Section 11.0 of the application. ASCMCRA requires that each application include a plan to minimize or prevent disturbance and adverse impact to fish and wildlife resources.

Fish and Aquatic Resources

Fish species identified as potentially residing in Marguerite and Emma Creeks include Arctic Grayling, Round Whitefish, Dolly Varden and Slimy Sculpin. Fish sampling efforts yielded an extensive distribution of Arctic Grayling and Slimy Sculpin. Only one White Fish and no Dolly Varden were found.

Subsistence and Personal Use of Harvest of Fish

There is a residential and spawning population of Arctic Grayling in Marguerite Creek. According to ADFG staff, in a personal communication, Arctic Grayling may spawn in the upper reaches of Marguerite Creek above the active mine area.

Fish Protection Plan

Fish protection strategies as required by Alaska statute will be met by designing the crossing of Marguerite Creek to meet all ADFG requirements.

For blasting the OSM setback requirements are more stringent than ADFG setback requirements and therefore will exceed ADFG requirements for blasting.

Findings

The application is in compliance with Sections 11 AAC 90.057, 11 AAC 90.081, 11 AAC 90.125(a)(6), 11 AAC 90.423, 11 AAC 90.457.

4.5 HYDROLOGY

4.5.1 Surface Water

Tertiary Nenana Gravel and the Coal-bearing group underlie all tributary drainages. Hoseanna Creek cuts through the northwest edge of the Birch Creek schist between Louise and Frances Creeks. Stream discharge of tributary drainages ranges from 0.01 to 11 cfs. By comparison, discharge at site 3M on Hoseanna Creek ranges from 14.3 to 1200 cfs. Wilber (1995) observed that south-facing non-permafrost coal-bearing basins have relatively low maximum discharge and high minimum discharge. Minimum flow in tributary drainages occurs during mid or late winter. No flow wasobserved in lower Louise Creek in late winter. Unit runoff variation among tributary drainages is attributed to basin Ethology.

Total suspended sediment concentrations in tributary drainages are relatively high due to poorly consolidated Tertiary lithologies, highly variable, and directly related to stream discharge. Most of the annual sediment load is transported over a short period of time during spring break-up or large summer storms.

In general, surface waters of the tributary drainages are slightly acidic to basic, and well-oxygenated. The pH ranges from 6.65 to 8.28. Dissolved oxygen concentration ranges from 9.0 to 16.5 mg/L. Alkalinity and total dissolved solid concentrations are highly variable. Lower stream reaches have higher values, except in Louise Creek. The alkalinity ranges from I to 354 mg/L as CaC03. Total dissolved solid concentration ranges from < 20 to 1210 mg/L. Relatively high alkalinity values in the lower stream reaches indicate that the water has good buffering capacity.

The chemical composition of the surface waters is influenced by the underlying Tertiary sedimentary rocks, specifically those of the coal-bearing group. Calcium is the dominant cation in most surface waters; bicarbonate is the dominant anion. However, lower Frances Creek has sodium chloride water. Lower Louise Creek has a mixed cation bicarbonate water in the summer and a sodium mixed anion water in the winter.

Nutrient and metal concentrations are low and show little variability. Iron and manganese have the highest concentrations. Lower Frances Creek has the highest concentrations of trace metals and elements. Concentrations do not exceed the primary maximum contaminant level listed in Alaska's drinking water quality standards.

4.5.2 Groundwater

The groundwater model presented in the JDRC application is based on Two Bull Ridge as a groundwater recharge area. The main points of the groundwater conceptual model are I) coal is the primary water-bearing unit, 2) permeability is controlled by fractures in the coal, 3) sandstone acts as an aquitard, siltstone and claystone as an aquiclude, 4) faults establish recharge boundaries and discharge zones; and 5) groundwater contributes to stream baseflow.

Based on seasonal measurements, most groundwater levels in the water-bearing units fluctuate only a few feet. Hydraulic conductivity values indicate moderate to relatively permeable coal seams, variable hydraulic conductivity among coal seams, and greater hydraulic conductivity in coal than in sandstone. Transmissivity of coal seams vary because each seam has a different hydraulic conductivity and aquifer thickness. Storativity values range from 14.3 to 10-4. Discharge rates to surface waters range from 2 to 54 gpm during the winter, leading to aufeis formation. These findings support the groundwater conceptual model presented in the application.

The chemical composition of the groundwater is similar among water-bearing units. Groundwater chemistry is also similar to surface water chemistry. Groundwater from wells completed in the 6 and 5 seams is of the calcium bicarbonate type. Groundwater from wells completed in the 4 and 3 seams is of the calcium bicarbonate type or mixed cation

bicarbonate type. Only the shallow groundwater of the Frances Creek alluvium displays sodium chloride water, with a high total dissolved solid content (8560 mg/L). The occurrence of the sodium chloride water is an anomaly. It is not typically associated with Tertiary sedimentary rocks or bedrock (schist) found in the Hoseanna Creek basin. It may be an upwelling of groundwater from a fault zone.

4.5.3 Probable Hydrologic Consequences

The probable hydrologic consequences are based on the present knowledge of the permit area and adjacent areas which are detailed in the permit application and in other water information sources. No significant disturbance of the aquifer is expected during the construction of the Jumbo Dome Mine Road Corridor or with the activities associated with this revision. Since there are no current, and unlikely to be any future, users within the area, the time for aquifer recharge is of no serious consequence. Groundwater recharge after road construction will be at least equal to that which existed prior to mining.

No toxic or acid forming stratum have been identified thus both surface and groundwater integrity should be maintained. No significant long-term adverse effects on the hydrologic regime should occur from the proposed mine development.

4.5.4 Cumulative Hydrologic Impact Assessment

The Alaska Surface Coal Mining Control and Reclamation Act of l982 requires that the Commissioner of the Department of Natural Resources assess the probable cumulative impact of all anticipated mining on the hydrologic balance outside the permit area before a mine permit is approved. Specifically, AS 27.21.180(c) requires that: "The commissioner may not approve an application for a permit or revision of a permit unless the application demonstrates and the commissioner finds, in writing and on the basis of information included in the application or information that is otherwise available to the commissioner and that the commissioner documents in the approval and makes available to the applicant, that an assessment of the probable cumulative impact of all anticipated surface coal mining in the area on the hydrologic balance has been made by the commissioner, and that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

4.5.5 Cumulative Impact Area

The cumulative effects of mining will include existing Usibelli Coal Mine, Inc. operations at Jumbo Dome Mine, Poker Flats (including Runaway Ridge and Major Revision "A"), Gold Run Pass(including Gold Run Pass Phase-5), and at Two Bull Ridge. For purposes of the surface water analysis, the cumulative impact area for the Hoseanna Creek Watersheed[2] includes all

2 HUC 12 Name Lignite Creek

surface waters upstream of Poker Flats Bridge Number 1 (authorized in the Poker Flats Mine permit), which is approximately 1,000 feet above the confluence of Hoseanna Creek with the Nenana River to the confluence of the unnamed stream in eastern half of Section 29 T11S R6W of the Fairbanks Meridian with Hoseanna Creek. Within the Marguerite Creek watershed[3], the cumulative impact area includes the area from the confluence with Bonanza Creek to the Marguerite Creek Crossing (Figure 2).

For the purpose of this Cumulative Hydrologic Impact Assessment (CHIA) the Two Bull Ridge Mine hydrologic data and modeling has been used as the basis for review since it provides analogous conditions for the JDRC permit area.

4.5.6 Surface and Groundwater Use in the Cumulative Impact Area

Surface water in the Cumulative Impact Area will be used for watering roads. Groundwater in this area will be the used by the applicant for drinking water and for washing equipment. A 120 foot well, located next to the boiler building near the applicant's shop and office, is used for drinking water. An 80 foot well, located at the Tipple on the west bank of the Nenana River, is used for washing equipment. There are no known users of water within the Cumulative Impact Area other than the applicant.

3 HUC 12 Name Marguerite Creek

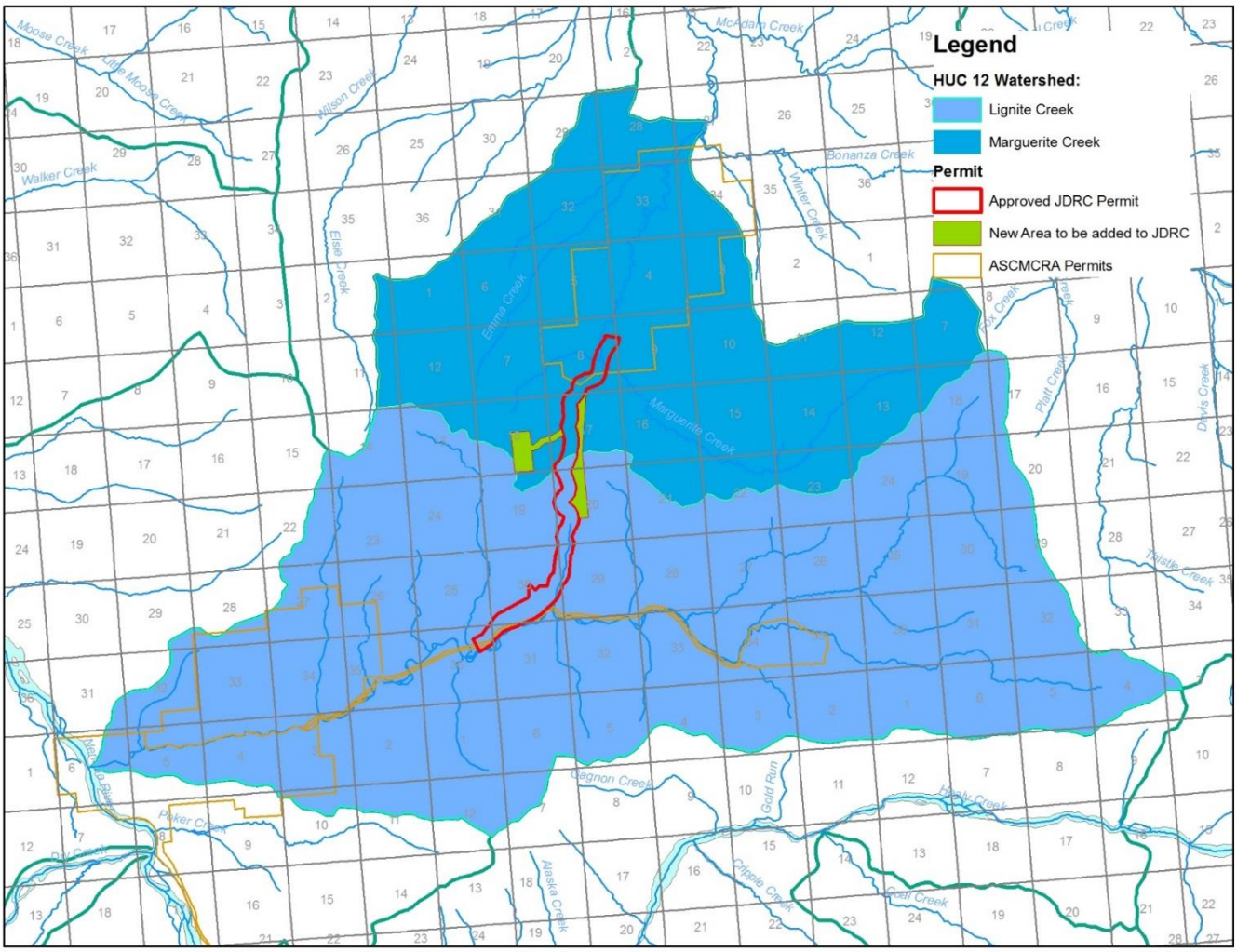

Figure 2 Cumulative Hydrologic Impact Area

4.5.7 Hydrologic Concerns

4.5.7.1 Surface Water Quality

Coal sequences contain shale, claystone, and sandstone which are impregnated with salts and trace elements, which upon exposure are more readily available to the hydrologic system (Scully and others, 1981). The hydrologic concerns for surface water quality are changes in surface water dissolved solid content and specific ionic concentrations. Another concern is change in total suspended sediment concentrations because of increased runoff and erosion potential associated with exposed topsoil, overburden, and interburden sedimentary rock.

4.5.7.2 Surface Water Quantity

The hydrologic concerns for surface water quantity are the short and long term effects on the quantity and timing of surface water flow and surface runoff off the road as a result of additional surface disturbance within the Hoseanna Creek and Marguerite Creek watersheds.

4.5.7.3 Groundwater Quality

The hydrologic concerns for groundwater quality are an increase in the total dissolved solids and changes in the chemical composition of the groundwater.

4.5.7.4 Groundwater Quantity

General groundwater flow is to the north, away from Hoseanna Creek, and into an area with no known inhabitants. Hydrologic concerns for groundwater quantity are analogous to that of surface water quantity concerns.

4.5.8 Cumulative Hydrologic Impacts

4.5.8.1 Surface Water Quality

The historic and recent water chemistry studies of Hoseanna Creek make it possible to examine long-term trends in the dissolved solid content, specific ion concentrations, and total suspended sediment concentrations in Hoseanna Creek over time. Cumulative impacts were assessed at Poker Flats Bridge # 1. Total dissolved solid content of Hoseanna Creek is dependent on the streamflow. Higher dissolved content as well as ionic and trace metal concentrations occur during baseflow, whereas lower concentrations occur during snowmelt or summer rains. Because ionic and metal concentrations are a function of discharge, discharge must be fairly constant to examine trends. Late summer baseline data for 1976, 1978, 1989, 1992, and 1994 was examined for a narrow streamflow range of 18 to 23 cfs. The total dissolved content increased from 359 mg/L in 1976 to 405 mg/L in 1994, indicating a slightly increasing trend over an 18-year period. It is apparent from these data that mining has not significantly increased the dissolved solid content of Hoseanna Creek under summer baseflow conditions. Some increase in dissolved solid content in Hoseanna Creek is expected with the addition of more permitted area in the basin. The increase is not expected to be significant because the permitted area is increasing about 8%. The Alaska water quality standard for total dissolved solids is 500 mg/L for drinking water and 1000 mg/1 for other water supply uses. Water supply for drinking is neither a present or foreseeable use of Hoseanna Creek.

Inorganic chemical constituents that have primary maximum contaminant levels for a public water supply were examined for trends using available data associated with a late summer-early fall discharge range of 18 to 23 cfs. No trend in dissolved barium, cadmium, arsenic, and chromium concentrations were observed using 1976 and 1989 data.

No trend was observed in dissolved fluoride and nitrate concentrations using 1976, 1989, and 1992 data. Inorganic chemical constituents that have secondary maximum contaminant levels for a public water supply were also examined for trends under the same conditions as mentioned above. No trend was observed in color and dissolved chloride, iron, manganese, pH, sodium, or zinc concentrations. In addition, no trend was observed in the major ion concentrations of calcium, magnesium, potassium, and bicarbonate.

Sulfate is the only ionic concentration that shows an increasing trend at Poker Flats Bridge # 1. Late summer baseflow sulfate concentrations in 1976, 1989, 1992, and 1994 were 81, 82, 102, and 111 mg/L, respectively. This represents a 37% increase over an 18-year period. These concentrations do not exceed the Alaska water quality standard for drinking water of 200 mg/L. Some additional increase in sulfate is expected with the increase in the affected environment associated with the proposed Jumbo Dome Mine Road Corridor. The increase is not expected to be significant because

the permit area is underlain by Tertiary sedimentary rocks rather than schist. Sulfate concentrations are higher in surface waters of drainage basins underlain by schist (Parks, 1983).

Because suspended sediments are the primary transport mechanism for trace metals, the total amount of trace metals added to surface waters should be a function of additional suspended sediment added (Parks, 1983). The mean suspended sediment concentration generally ranged from 50 to 350 mg/L during the summer months in 1993 to 1996 at Poker Flats Bridge# I.

4.5.8.2 Surface Water Quantity

Typical recharge and stream flow in the region is generated from precipitation and snowmelt. Flows vary seasonally with peak flows occurring in the spring and early summer as a result of ice breakup and snowmelt. Late summer and early fall flows are the result of rainfall.

The combined flows draining into and contributing flow to Hoseanna Creek from the proposed Jumbo Dome Mine Road Corridor is a relatively small proportion of the overall flow recorded and/or estimated to exist within Hoseanna Creek. At reported minimum measured flows (Usibelli Coal Mine, 1996) (all flows measured during ice-free period) the combined discharges of the drainages impacted by the Two Bull Ridge operation from Two Bull, Frances, Badlands, and Louise Creeks are 0.11 cfs. Minimum measured flow in Hoseanna Creek is 14.3 cfs at Gold Run Pass Bridge #3. The minimum measured flows from the combined four drainages of the Two Bull Ridge operation represent less than 1.6% of the flow in Hoseanna Creek.

At maximum measured discharges (Usibelli Coal Mine, 1996) the combined flows from the Two Bull Ridge affected streams is 28.4 cfs. Maximum measured discharge at Hoseanna Creek is 1200 cfs. Thus, at high flows the combined contribution of flow from the Two Bull Ridge affected streams to the flow within Hoseanna Creek is less than 2.4%. Continuing this analysis to the expected peak discharges (Usibelli Coal Mine, 1996); at the 2 year recurrence interval the Two Bull Ridge streams combine to just over 2.2% of predicted Hoseanna Creek discharge; at the 5 year recurrence interval the Two Bull Ridge streams combine to just over 2.7% of

predicted Hoseanna Creek discharge; at the 50 year recurrence interval the Two Bull Ridge Streams combine to just over 3.6% of predicted Hoseanna Creek discharge.

Maximum impact to surface water flow is expected to occur during active mining. Mining plans are such that not all of the Two Bull Ridge affected streams will be in operation at one time. Assuming that each drainage affected by mining contributes approximately one fourth to the combined flows referenced above, then even a 50% change in flow on one of the affected streams would at most have a combined impact of no more than one-half of one percent effect on Hoseanna Creek flow. The 50% change in flow figure used here is illustrative; it is unlikely that any sustained change of that magnitude will take place.

Given these values the expected impact on surface water quantity during disturbance activities at JDRC should be minimal to non-measurable. Once the impacted area has been reclaimed, expected flows from affected streams are expected to be non-measurable, and therefore the long term impact on Hoseanna Creek at Poker Flats Bridge #1 is expected to be non-measurable.

4.5.8.3 Groundwater Quality

The coal seams are the primary water-bearing units in the permit area. Groundwater from wells completed in the 6 seam is of the calcium bicarbonate type, whereas groundwater from wells completed in the 4 and 3 seams is of the calcium bicarbonate type or mixed cation (calcium > magnesium > sodium) bicarbonate type. Bicarbonate is the dominant anion in groundwater from the coal seams. The predominance of bicarbonate ion indicates the ability of the groundwater to buffer additions of acid or base. The groundwater is acidic, ranging from pH 5.8 to pH 6.8. Total dissolved solid concentrations range from 101 to 260 mg/L. There are no anomalous concentrations of nutrients, trace elements, or metals in the groundwater associated with the coal seams in the permit area, including the new area to be disturbed under this major revision.

4.5.8.4 Groundwater Quantity

Groundwater flow in the Two Bull Ridge area is to the north towards an area with no known inhabitants, and away from Hoseanna Creek. Potential impacts from mining are small due to the lack of any documented or recognized user of the groundwater to the north of the Two Bull Ridge area. Generally, as found in other areas of the Hoseanna Creek basin, groundwater tends to be confined within the separate layers of the coal seams. This accounts for variability in quality and quantity found in wells, depending on the depth of the screened interval.

Based on historic well sampling, wells in coal seam #2 have yielded up to 95 gallons of water per hour (Ray, Vohden, and Roe, 1991). Similarly, water from coal seam #3 has successfully been pumped at comparable rates. Although other wells monitored have produced water at a slower rate of 1-3 gallons per hour, the historic sampling data reveal that it has primarily been the method of water extraction itself that is the limiting factor, rather than the hydraulic yield of the well. Because mining in the Two Bull Ridge area will be bounded by seam #3 through seam

#6, the high yields found in seam #3 will be encountered at the lowest point of mining. Based on Poker Flats Mine dewatering data, wells there have produced flows on the order of 120 to 600 gallons per hour. This type of pumping is more aggressive in terms of producing flow than pumping from wells for monitoring purposes, and indicates that there is sufficient water supply such that there is not a major concern due to loss of quantity.

Based on information from the baseline monitoring program (Usibelli Coal Mine, 1996), multiple piezometers and monitoring wells have been placed within the active seams in the Two Bull Ridge area and also such that there is monitoring beyond the extent of the mining limits. Recent well installation has proven that there is distinct isolation between the water bearing units of the #2 and #3 seams. This indicates that there is a separate water bearing unit below those that will be impacted by mining, which will be available for use as a water resource should the need arise in the future. As production proceeds, these wells will yield valuable information on water levels which can be used to assess the prevalence of groundwater in the mine over time.

4.5.9 Material Damage Assessment

AS 27.21.180(C)(3) and 11 AAC 90.125(A)(1) require a cumulative hydrologic impact and resulting material damage assessment of all current and planned mining on the hydrologic balance within the Cumulative Impact Area.

No permanent material damage to ground or surface water quantity or quality is expected as a result of the activities associated with this revision. The majority of disturbance will be from the removal of surface gravel (to an average anticipated depth of less than 40 feet) and will not require extensive mining through perennial or intermittent streams or through the primary coal bearing aquifers. There may be some temporal changes to surface flows which affect runoff, however they will be mitigated through the use of sediment control measures. Groundwater may also be slightly impacted as infiltration patterns are disrupted by gravel extraction however, once vegetation is re-established per the reclamation plan requirements these infiltration rates should be equal to or slightly greater than prior to disturbance. Similar impacts and associated mitigation measures can be expected with the expansion of the existing access road to the gravel site. State water quality standards are not expected to be exceeded for the existing use or for the foreseeable future based on the information available to date.

4.5.10 References Cited

Parks, Bruce, 1983, Trace metals in surface water and stream sediments of Healy and Hoseanna Creek basins, Alaska: U.S. Geological Survey Water-Resources Investigations Report 83-4173, 26 p.

Ray, Scott R., and Vohden, Jim, 1993, Streamflow, sediment load and water quality study of Hoseanna Creek basin near Healy, Alaska: 1992 progress report: Alaska Division of Geological and Geophysical Surveys Public-data file Report 93-78, 43 p.

Ray, Scott R., Vohden, Jim, Roe, J.T., 1991, Streamflow, sediment load, and water quality study of Hoseanna Creek basin near Healy, Alaska: 1990 progress report: Alaska Division of Geological and Geophysical Surveys, Public-data file Report 91-20, 65 p.

Scully, David R., Krumhardt, Andrea P., and Kernodle, Donald R., 1981, Hydrologic reconnaissance of the Beluga, Peters Creek, and Healy coal areas, Alaska: U.S. Geological Survey Water-Resources Investigations Report 81-56, 79 p.

Usibelli Coal Mine, Inc., 1996, Two Bull Ridge Mine surface coal mining permit application. Four volumes submitted to Alaska Department of Natural Resources, Division of Mining and Water Management, December 1996.

Usibelli Coal Mine, Inc., 2006, Jumbo Dome Mine Road Corridor surface coal mining permit application. Four volumes submitted to Alaska Department of Natural Resources, Division of Mining Land and Water, Apri12006.

4.5 Bonding

Part 'D'; Section 10.0 of the permit application details the proposed reclamation bonding assumptions and calculation submitted by Usibelli Coal Mine, Inc. UCM has calculated a bond for the second 5 year permit term that reflects their liability for the road corridor. This amount was calculated at $102,697. Since the beginning of the permit term, reclamation bond amount was adjusted up to $121,732 to cover the cost of removing a fuel storage and the reclamation of a haul truck parking area with in the permit boundary.

As part of the application for an incidental boundary revision and addition of a new material site in the JDRC permit, UCM calculated a reclamation bond of $73,591 to cover the reclamation cost of the additional disturbance requested as part of this revision. This would bring the total bond for the second permit term to $195,323.

DMLW-Mining conducted an initial review of the calculations and found no errors in the general methodology or values used. DMLW-Mining concludes, using the available information, that the proposed bond amount is sufficient to conduct the required reclamation for disturbances during the remainder of the second 5 year term of the Jumbo Dome Mine Road Corridor.

4.6 Finding of Reclaimability

Based upon the reclamation plan, supporting evidence derived from local and regional re-vegetation research, in consultation with the Alaska Plant Material Center, and the regulations promulgated by the Alaska Division of Mining, Land and Water the following reclamation practices were found to be feasible and acceptable: There is ample evidence in the literature and local experience at other coal mine sites in the region that indicates the re-vegetation of the regraded and top soiled areas will occur.

As required by AS 27.21.180(c)(2) and based on information contained in the application, consultation with other State and federal agencies, we find that mining and reclamation plan as stipulated in this decision demonstrate that reclamation is feasible.

4.7 Stipulations

4.7.1 General Stipulations:

In accordance with AS 27.21 and 11 AAC 90, the permit will be contingent on the following general stipulations are:

A. The permittee shall conduct operations only on that land which is approved for the term of this permit and that is subject to the performance bond or other equivalent guarantee in effect under 11 AAC 90.20l.

B. The permittee shall conduct all operations only as described in the approved application, except to the extent otherwise directed in the decision of the Commissioner of the Department of Natural Resources.

C. The permittee shall comply with the performance standards of 11 AAC 90.30l through 11 AAC 90.50l.

D. The permittee shall allow the authorized representatives of the Commissioner and the Secretary of the Interior the rights of entry specified in 11 AAC 90.60l through 11 AAC 90.603.

E. The permittee shall take all possible steps to minimize any adverse impact to the environment or public health and safety resulting from noncompliance with any condition or stipulation of the permit, including:

(1) any accelerated or additional monitoring necessary to determine the nature, extent, and results of noncompliance;

(2) immediate implementation of measures necessary to comply; and

(3) warning, as soon as possible after learning of the noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.

F. The permittee shall pay all reclamation fees required by 30 CFR Part 870 for all coal produced under this permit.

4.7.2 Special Stipulations

In accordance with AS 27.21 and 11 AAC 90, approval of the revision is granted subject to the following special stipulations:

A. PROHIBITION OF INCIDENTAL COAL REMOVAL OUTSIDE OF THE DECEMBER 2006 PERMIT BOUNDARY. The removal of coal from areas added to the

original JDRC permit cannot be authorized as part of an incidental boundary revision under 11 AAC 90.129(a)(7). Additional coal extraction for commercial purposes can only be authorized via a new ASCMCRA permit. The requirements for incidental coal removal under 11 AAC 90.652 to 11 AAC 90.669 are not met for the Carters Corner Material Site.

If a significant coal seam is encountered during the construction of the access road to the Carters Corner Material site that impacts haul road stability, UCM may submit a request to remove only the coal that impacts stability. The request must include the total volume of coal to be removed and a discussion of whether the coal will be disposed of as "waste coal" or sold for commercial purposes and what other mitigation measures were considered prior considering a request for removing coal within the access road footprint.

APPENDIX A: RESPONSES TO AGENCY COMMENTS

Following are the Department of Natural Resources, Division of Mining Land and Water (DMLW), Mining Section responses to the written comments received from the public during the comment period (August 24, 2016 to October 14, 2016) for a Major Revision of the Jumbo Dome Road Corridor Permit.. DMLW-Mining received a total of 2 comment letters containing suggestions for requirements to be included in any permit approval.

Comments and Responses to Comments

Comment (C): The United State Fish and Wildlife Service (USFWS) submitted comments regarding threatened and endangered species, migratory birds, and bald and golden eagles.

- The USFWS found no threatened or endangered species in the project area and did not expect project-related activities to adversely impact listed species.
- The Migratory Bird Treaty Act (MBTA) prohibits the willful killing or harassment of migratory birds. To minimize impacts to nesting birds the USFWS recommends land-disturbing activities (e.g., initial clearing, excavation, fill, blasting) in potentially suitable nesting habitats be completed prior to or after the spring and summer breeding season between May 1 through July 15.
- The Bald and Golden Eagle Protection Act (BGEPA) protects eagles from take, as well as from disturbance to their nests, roosts, and foraging sites.
- The USFWS is recommending that:
  - UCM update their raptor nest survey data
  - the survey distance extends two miles from any long-term disturbances or permanent impacts
  - surveys be conducted by a biologist with experience in aerial raptor surveys
  - surveys be conducted in the spring prior to leaf out, when the nests are active and more easily identified; and as close to the start of construction as possible.
- If eagle nests are identified during a survey UCM is asked to contact the USFWS office to discuss 1) strategies for avoiding and/or minimizing take; and 2) applying for an Eagle/Eagle Nest Take permit if avoiding take is determined to be impracticable.
- If an unoccupied eagle nest will not be damaged, work could be conducted outside of the nesting season, which is March 1 through August 31 for all raptors, including eagles.

This would avoid impacts, including disturbance, to any nesting eagles adjacent to the operation.

Response (R): An updated eagle nest survey was conducted for a 5 mile area around the Jumbo Dome Mine permit area in June of 2016. The area covered under the survey also incorporates the area of this permit revision and as such, a copy of the survey was submitted to DMLW-Mining to address USFWS's comment. USFWS guidelines will be followed should any new nests be identified. To protect migratory birds, initial clearing of undisturbed land will not be conducted between May 1st and July 31st of any year.

C: The Alaska Department of Fish and Game (ADF&G), Division of Habitat submitted comments. ADF&G stated that they had no direct fish and wildlife resource concerns or access concerns with the proposed revisions. ADF&G did state though that surface disturbance can lead to loss of wildlife habitat and an increase in nonpoint source sediments in downslope fish habitats. ADF&G recommended that DNR and UCM explore options that could reduce the total area disturbed and the amount of sideslope area that would need reclamation. They included an example that involved modifying the permit boundary.

R: DMLW-Mining worked with UCM to decrease the proposed permit boundary from 448 acres to 300 acres and to minimize disturbance areas to the extent practicable.